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Peculiarities of pinning and microwave absorption hysteresis in thin superconducting films

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Abstract

The results of experimental and theoretical studies of the hysteretic microwave absorption (MWA) in the superconducting Bi2Sr 2CaCu2O8 thin films are presented. It has been found experimentally that the hysteresis loop manifests some unusual features such as the non-monotone hysteresis variation and the change of a hysteresis sign. We have shown that such unusual behavior is due to the special nature of the bulk pinning in a superconducting film with a thickness comparable with the field penetration depth. The theoretical model of the MWA hysteresis has been developed taking into account the inhomogeneous distribution of centers with different symmetry of a pinning potential and their variation with the magnetic field value.
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Keywords

Microwave absorption, Pinning centers, Potential wells, Thin films